

THE WESTERN AUSTRALIAN NATURALIST

- JUL 1985

Vol. 16

June 15, 1985

Nos. 2/3

C.E.H. OSTENFELD (1873-1931): A DANISH BOTANIST'S CONTRIBUTION TO WESTERN AUSTRALIAN BOTANY

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INTRODUCTION

In 1983 the Western Australian Herbarium convened a Botanical History Group of local botanists to gather biographical data on plant collectors and botanists who have contributed to taxonomic research on the native flora.

The present author, who is a member of this Group, undertook to prepare a paper on the contribution Ostenfeld made to Western Australian botany. This paper brings together for the first time both botanical and biographical aspects of Ostenfeldiana mostly recorded in research papers published in a wide range of scientific journals.

Ostenfeld's Visit in Western Australia

Carl Emil Hansen Ostenfeld visited Western Australia in 1914 at the invitation of the British Association for the Advancement of Science to attend the Perth Session of its Eighty-fourth Annual Meeting, the sessions of which were held concurrently in each of the capitals of the States of the Commonwealth of Australia.

As a result of an accident during the voyage to Western Australia, Ostenfeld was hospitalised in Perth during the period of the British Association Meeting there. When he had recuperated from his misfortune he spent a few months studying the flora of the State before returning to Copenhagen.

Ostenfeld (1916) relates how he spent from August to the end of October in South Western Australia where he made local excursions by train to Cottesloe, Bayswater, Cannington, Mundaring and Armadale. Then he went by train to Busselton, Bridgetown, Big Brook in the Karri forest, and Albany. He also visited Tammin and Kalgoorlie.

On these excursions he collected and annotated large suites of specimens of the vascular flora, including sea-grasses from the seashore sites he visited. These collections were deposited in the Botanical Museum in Copenhagen.

He was generously assisted by the Government of Western Australia and by several local citizens. He expressly acknowledged the kind assistance of the Hon. W. Kingsmill, M.L.C.; Mr Cecil Andrews, Director of Education, and also an amateur botanist; Mr W. Catton Grasby, Editor of the Western Mail and a keen naturalist; Professor and Mrs W.J. Dakin, (Professor Dakin was the inaugural Professor of Biology at the University of Western Australia); Mr Bernard H. Woodward, Director of the Perth Museum and Art Gallery; Mr W.B. Alexander, Keeper of Biology, Perth Museum; Mr O.H. Sargent, pharmacist of York, and a keen amateur botanist; Mr R. Strelitz, then Royal Dutch Consul; Mr Fred. A. Hadley, surgeon attending Ostenfeld at St Omer Hospital, West Perth; and the Proprietress of St Omer Hospital, Mrs Miriam Davis, who assisted Ostenfeld in collecting flowering specimens and seeds. A fellow country-man, Mr Erik Dorph-Peterson, resident in Perth, also collected specimens for him.

Ostenfeld left Fremantle about the 27th October by ship for Java, calling en route at Geraldton, Carnarvon, Point Sampson, Port Hedland, Broome and Derby. At each of these ports, while the ship discharged cargo, he had a few hours to observe and collect the coastal vegetation. Although he claimed these brief shore visits gave him little chance to achieve much botanical field work, he collected the major species of the mangrove, salt-pan, sand-dune, and savannah forest communities of the tropical shore-line (Ostenfeld 1918).

On his return to Copenhagen, Ostenfeld completed the determination of his specimens with the assistance of several notable taxonomists at Copenhagen, Berlin, Kew Herbarium, British Museum (Natural History), the Herbaria of the Botanic Gardens of Sydney and Melbourne, and Mr J.M. Black of Adelaide.

His "*Plantae ex Australia occidentali*" collection comprised about 1,300 separate numbers. A complete set is housed in the Botanical Museum, Copenhagen and duplicates are in KEW, PERTH, and in the Herbarium, National Botanic Gardens, Glasnevin (DBN) in Dublin, Ireland (Nelson and Scannell 1978).

The set of 679 duplicates at Glasnevin was purchased in 1922 by the National Museum of Dublin. On the amalgamation of the herbaria of the National Museum and the National Botanic Gardens at Glasnevin in 1970 the Ostenfeld collection was mounted and in 1976 was incorporated in the herbarium (DBN). Nelson and Scannell (1978) give an account of this collection with a catalogue of the specimens and their collection data.

The results of Ostenfeld's investigations of the Western Australian flora were published in three papers as Contributions to Western Australian Botany, namely, Part I. - The Sea-grasses of West Australia (Ostenfeld 1916); Part II - included Stray Notes from the Tropical West Australia (Ostenfeld 1918); A Revision of the West Australian species of *Triglochin*, *Crassula* (*Tillaea*) and *Frankenia* (Ostenfeld 1918); and Chenopodiaceae from West Australia by Ove Paulsen (1918); Part III - Additions and Notes to the flora of extra-tropical West Australia (Ostenfeld 1921). This last part completed his account of the flora by listing 430 species with their collection sites, ecological notes, and critical notes on their taxonomy. Several new combinations were made and several new species described.

In his paper on the marine vascular flora, Ostenfeld (1916) gave a brief history of the previous collections of sea-grasses from the Western Australian coast, and reviewed their taxonomy. He described a new species, *Cymodocea angustata* Ostf., he collected at Carnarvon. He also discussed at some length the morphology, anatomy and habitats of *Cymodocea isoetifolia* Aschers. (= *Syringodium isoetifolia* (Aschers.) Dandy); *C. antarctica* (Labill.) Endl. (= *Amphibolis antarctica* (Labill.) Sond. and Aschers.); *Diplanthera uninervis* (Forsk.) Aschers. (= *Halodule uninervis* (Forsk.) Aschers.); *Halophila ovalis* (R. Br.) Hook.f.; *H. spinulosa* (R.Br.) Aschers; and *Posidonia australis* Hook.f.

Ostenfeld also described the morphology and anatomy of several detached leaves of a narrow-leaved form of *Posidonia* he collected at Carnarvon, but for want of whole shoots and fertile material did not assign it specifically. Den Hartog (1970) examined Ostenfeld's material and illustrations of this form, and identified the leaves as conspecific with *Posidonia ostenfeldii* den Hartog 1970.

Ostenfeld wrote four other papers on aspects of the Australian flora, namely, two on additions to and cataloguing of Australian sea grasses (Ostenfeld, 1929a, 1929b), a general account of the geography and vegetation of Western Australia (1915), and a paper on his general impressions of the phytogeography and industrial development of the parts of the State he visited (1916).

We may discern from his papers on the Western Australian flora that he was an accurate observer of species and plant communities, and cautious in his interpretations of their affinities.

Two Western Australian plants were named in honour of Ostenfeld, the chenopod, *Kochia ostenfeldii* Paulsen 1918 (= *Maireana pentatropis* (Tate) P.G. Wilson 1975) and the sea-grass *Posidonia ostenfeldii* den Hartog 1970.

Ostenfeld's Botanical Career

The botanical career of Carl Ostenfeld has been described by his friend and colleague Ojvind Winge in an obituary (Winge 1931). This biography, briefly summarised here, shows the diversity of Ostenfeld's researches in Denmark and abroad.

Carl Emil Hansen Ostenfeld was born in Randers, Denmark on 3rd August, 1873, where his father Carl Emil Hansen was medical officer. His mother's maiden name was Ostenfeld, and later in life Carl dropped the Hansen from his surname. He matriculated from a school in Nykobing (Falster) in 1891 and obtained his M.Sc. in botany in 1897. In 1900 he was appointed curator of the

Botany Museum of the University of Copenhagen. In 1906 he was awarded a Ph.D. for his thesis on the land vegetation of the Faroes with special reference to the higher plants.

Ostenfeld remained at the museum for 18 years before being appointed to the Chair of Botany at the Royal Veterinary and Agricultural College in Copenhagen. In 1923 he was appointed to the Chair of Botany at the University of Copenhagen, and made Director of the University Botanic Garden (Nelson and Scannell 1978). He held these posts until his death in 1931.

His scientific accomplishments were largely connected with his expeditions and his extensive field work. In 1895-96 he was a member of the Tergolf Expedition to the Faroes, Greenland and Jan Mayen. In 1897 he again visited the Faroes. The floras of these islands gave Ostenfeld an abiding interest in Arctic vegetation, on which he published extensively. His travels included working visits to the Mediterranean, Danish West Indies, Canada and the United States and to Western Australia. He also travelled extensively in Europe.

Ostenfeld initiated and led an ecological survey of the Danish flora. This project stimulated much interest and activity among botanists and laymen, and greatly added to the knowledge of the biology of the Danish flora.

He was especially interested in marine vascular plants (sea-grasses), an interest apparently developed from his studies of the occurrence of *Zostera marina* in Danish waters. He published on the taxonomy and ecology of sea-grasses of the Mediterranean, Western Australia and those of other oceans. His research on aquatic flora also included studies of marine and freshwater phytoplankton of Danish waters and of collections sent him by expeditions to many parts of the world.

Winge (1931) remarked that it seemed incredible that Ostenfeld could have cultivated still other fields of research, but he did indeed leave his mark in quite another field, namely, in reproductive biology of flowering plants.

Ostenfeld, working with the great plant geographer Christen Raunkiaer, researched the nature of apogamy (vegetative reproduction) in the angiosperm genus, *Hieracium*. They were greatly assisted in their investigations by the eminent Swedish cytologist, Otto Rosenberg, who advised on the necessary cytological techniques for this research. Overall, Ostenfeld had an insight for what genetic experiments and cytological investigations could bring the systematist. He was extremely interested in the nature of plant speciation and was aware of the large role the relationship of chromosomes played in the formation of new species (Winge 1931).

Ostenfeld was a prolific author. He wrote about 200 papers and numerous other works, (see Nat. Union Cat. 1976) all of them showing the stamp of great precision. In collaboration with Professor A. Muntz, he published the excellent and popular scientific work, "Nordens Flora" (1901-1907), and a second edition in expanded form in 1917-1927.

ACKNOWLEDGEMENTS

I wish to thank the Western Australian Botanical History Group of the Western Australian Herbarium for making available their file of research documents on Ostenfeld, and particularly Mrs Joan Brodsgaard of that Group who collected several of these documents from sources in Denmark.

Mrs B. Sorensen kindly translated Winge's obituary of Ostenfeld, and Mrs M.C. Phillips of the library of the Geology Department, University of Western Australia assisted with interpretations of the translations.

REFERENCES

- CHRISTENSEN, C. 1913. Den danske botaniske litteratur, 1880-1911.
CHRISTENSEN, C. 1940. Den danske botaniske litteratur, 1912-1939.
HARTOG, C. den. 1970. The Sea-grasses of the World. *Verh. Kon.Ned. Akad. Wetensch. Afd. Naturrh. Tweede Reeks*, 50:1-275.
MAULE, A.F. 1974. Danish Botanical Expeditions and collections in foreign continents. *Bot. Tidsskr.* 69:167-205.
NATIONAL UNION CATALOGUE, pre-1956 Imprints, 1976. Vol. 434, London, Mansel.

- NELSON, E.C. & M.J.P. SCANNELL. 1978. C.E.H. Ostenfeld's Western Australian plants in the Herbarium, National Botanical Gardens, Glasnevin, *Glasra* 2:1-24.
- OLRIK, G. 1974. C.E. Hansen Ostenfeld, Director of the Botanical Garden from 1923 to 1931. *Berætn. bot. Hav. Virks.* 1972-74, p.p. 81-82. Kobenhavns Univ. Bot. Have.
- OSTENFELD, C.H. 1915. On the geographical distribution of sea-grasses. A preliminary communication. *Proc. R. Soc. Vic.* 27:181-190.
- OSTENFELD, C.H. 1915. Skildringer af Væst. Australiens Natur, særligt dets Plantevækst. *Geogr. Tidsskr.* 23:35-46, 132-148.
- OSTENFELD, C.H. 1916. Contributions to West Australian Botany. Part 1 - The Sea-grasses of Western Australia. *Dansk bot. Ark.*, 2:1-44.
- OSTENFELD, C.H. 1916. Vest-Australien, Indtryk fra en Rejse i 1914. *Nord. Tidskr.* 1916:61-76, 101-119.
- OSTENFELD, C.H. 1918. Contributions to West Australian Botany, Part II. Stray notes from the tropical West Australia. *Dansk bot. Ark.* 2(8): 1-66.
- OSTENFELD, C.H. 1921. Contributions to West Australian Botany, Part III. Additions and notes to the flora of extra-tropical W. Australia. *Det. Kgl. Dansk. Vidensk. Selskab. Biol. Medd.* III, 2:1-144.
- OSTENFELD, C.H. 1929a. A list of Australian sea-grasses. *Proc. R. Soc. Vic.* 42:1-4.
- OSTENFELD, C.H. 1929b. Additions to the list of Australian Sea-grasses. *Proc. R. Soc. Vic.* 43:1.
- PAULSEN, O. 1918. Chenopodiaceae from Western Australia. in C.H. Ostenfeld: Contrib. West. Aust. Bot. II. *Dansk. bot. Ark.* Bd. 2, (8): 55-66.
- PAULSEN, O. 1931. C.H. Ostenfeld 1873-1931. *Bot. Tidsskr.* 41:269-282.
- WILSON, P.G. 1975. A taxonomic revision of the genus *Maireana* (Chenopodiaceae). *Nuytsia* 2:2-83.
- WINGE, O. 1931. Carl Emil Hansen Ostenfeld - Mindeord. *Overs. K. danske vidensk. Selsk. Forh.* 1930-1931: 91-99.

IRRUPTION OF WHITE-NECKED HERON (*ARDEA PACIFICA*) INTO SOUTH-WESTERN AUSTRALIA IN 1975.

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INTRODUCTION

Serventy (1953) documented a southern invasion by certain northern birds into southwestern Australia in 1952. He noted that these movements were evident in the whole of southern Australia, and concluded that they were closely related to an unusual sequence of weather conditions in northern and central Australia. Extensive flooding of the Lake Eyre basin in 1949 and 1950 resulted in the first recorded filling of Lake Eyre. Consequent upon these favourable breeding conditions, bird populations built up to high levels; the populations could not be sustained in the ensuing dry conditions of 1951-2 and a mass southerly movement occurred in 1952.

The effect of episodic rains and changing water levels on the breeding physiology of avian species has been known since the pioneering studies of Serventy and Marshall (1957). Since then numerous workers (e.g. Frith, 1967 and Bekle, 1983) have examined the effects of unseasonal precipitation on the breeding behaviour of various species of waterfowl, and like Serventy and Marshall (*ibid*) they indicate clearly that rainfall triggers breeding. Some of these authors also indicate that heavy rainfall triggers waterfowl movement. This rainfall may be regular and seasonal or it may result from unpredictable episodic events such as tropical cyclones, events that may produce major areas of short term mesic environments (Gentilli, 1956).

This paper examines the irruption of the White-necked Heron (*Ardea pacifica*) into south-western Australia in 1975 and relates this to rainfall in different parts of Australia.

RAINFALL PRECEDING AND DURING THE 1975 IRRUPTION

In 1973 above average rains fell in eastern and northern Australia after several